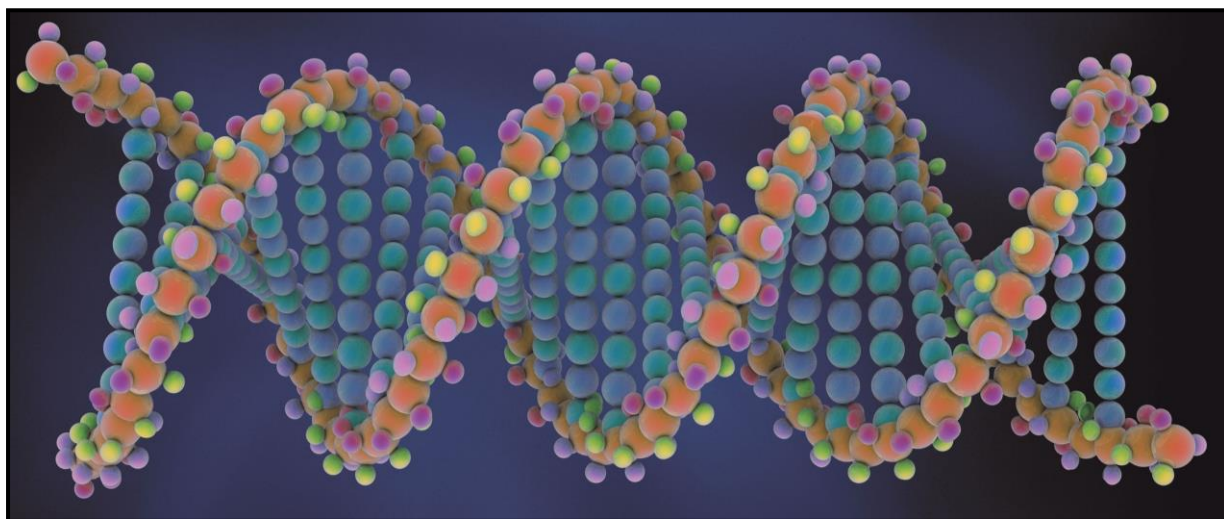


S.Y.B.Sc. Biotechnology 2020 - 2021

Molecular Biology



Source : www.bates.edu

SEMESTER - III

BIO-III.C-5

Ms. Madhavi M. Motankar

Assistant Professor

Department of Biotechnology

Parvatibai Chowgule College of Arts and Science Autonomous

Gogol, Margao Goa

Email: mmm009@chowgules.ac.in

COURSE SCHEDULE

THEORY

Mondays & Tuesdays – 10:45 to 11:45am and **Wednesdays** – 9:30 to 11:45am; **Fridays** – 8:30 to 9:30am

Lecture	Lecture topics	References
L1	Introduction to syllabus, course and CAs	Verma, P.S. & Agarwal, V.K. (2013).
L2	Experiments proving DNA as genetic material – Activity class	
L3	S. F. Griffith's transforming principle	
L4	Avery and Hershey and Chase Experiment	
L5	Chargaff's experiments and law	
L6	Watson – Crick Model of DNA	
L7	Evidences for RNA as the genetic material of some viruses	
L8	Experimental evidence for semi-conservative DNA replication in E.coli – Meselson and Stahl's experiment	Molecular biology by Rastogi S.
L9	Basic requirements of DNA replication	
L10	DNA polymerases: structure and function	
L11	Ancillary proteins associated with replication	
L12	Replication of circular DNA (rolling circle model)	Verma, P.S. & Agarwal, V.K. (2013).
L14	Mechanism of replication in prokaryotes: initiation, Elongation	
L15	Termination	
L16	Mechanism of DNA replication in eukaryotes	
L17	Mechanism of prokaryotic transcription, factors and machinery	
L18	Formation of initiation complex; RNA polymerase enzyme	
L19	Initiation process of prokaryotic transcription	
L20	Elongation and termination	
L21	Transcription in eukaryotes - eukaryotic RNA polymerases	
L22	Transcription factors	
L23	Promoters and Enhancers	
L24	RNA processing: capping, splicing, polyadenylation	
L25	CA-1: Online MCQs (Objective) test - 30marks Review of CA-1 test	
L26	Central dogma and Genetic code	Verma, P.S. & Agarwal, V.K. (2013).
L27	Mechanism of protein synthesis in prokaryotes - Initiation	
L28	Elongation and termination	
L29	Mechanism of protein synthesis in eukaryotes- activation of a.a.	
L30	Initiation and Elongation	
L31	Termination	
L32	Post-translational modifications- phosphorylation, acylation, glycosylation & disulphide linkage.	
L33	Mutations and types of mutations	De Robertis, E.D.P. and De Robertis, E.M.F. (2006).
L34	Spontaneous and induced mutation	
L35	Missense, silent, frameshift, reversion mutation	
L36	Physical and chemical mutagens (ethidium bromide, alkylating agents, base analogy)	
L37	DNA Repair Mechanisms: Mismatch	
L38	Photo-reactivation repair, Excision repair.	
L39	Regulation of Gene expression	
L40	Lactose operon	
L41	Tryptophan operon	
L42	Conjugation	

L43	Transformation	Harris, D.
L44	Transduction	
L45	CA-2: E-assignments (subjective test) - 30 marks	
L46	Review of CA 2	

REFERENCES

1. Krebs, J.E., Goldstein, E.S. & Kilpatrick, S.T. (2014). Lewin"s Genes XI, Jones and Bartlett India Pvt.Ltd.
2. Nelson, D. L. & Cox, M.M. (2000). Lehninger"s Principles of Biochemistry (3rd Edition), Worth Publishers, New York, USA.
3. Karp, G. & Harris, D. (2008) Cell and Molecular Biology – Concepts and Experiments, John Wiley & Sons Inc, New York.
4. De Robertis, E.D.P. and De Robertis, E.M.F. (2006). Cell and Molecular Biology. VIII Edition. Lippincott Williams and Wilkins, Philadelphia.
5. Watson, J.D., Hopkins, N.H. et al. (2008). Molecular Biology of the Gene, Garland Publishing (Taylor & Francis Group), New York & London.
6. Verma, P.S. & Agarwal, V.K. (2013). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, S. Chand & Company Pvt. Ltd.

PRACTICAL SCHEDULE

Fridays from 8:30am to 10:30am in Biotechnology laboratory

Practical No.	Practical topics
P1	Isolation of genomic DNA from prokaryotes
P2	Isolation of genomic DNA from eukaryotes
P3	Isolation of genomic RNA
P4	Agarose gel electrophoresis
P5	Determination of molecular size of DNA by agarose gel electrophoresis
P6	Mutagenesis in E. coli cells – UV survival or chemical mutagens
P7	Purity of DNA by spectrophotometric method

*** MANDATORY ITEMS TO BE CARRIED FOR PRACTICALS;**

- 1. Laboratory note book and pen**
- 2. Laboratory coat**
- 3. Hand gloves**

*Note:

1. Practical protocols have been uploaded on Google Classrooms for your reference.
2. You are requested to go through the same and come prepared for better understanding during the practical session.

X-----X